Tuberculin as a Dispensary Agent in the Diagnosis and Treatment of Tuberculosis.

by

George Younger Richardson, M.B., Ch.B.

Tuberculin as a Dispensary Agent in the Diagnosis and Treatment of Tuberculosis.

Dr. Robertson, the Medical Officer of Health for Leith, in anticipation of the Insurance Act, succeeded over a year ago in obtaining sanction to establish a Tuberculosis Dispensary and I was placed in charge of it from its commencement.

From small beginnings, this dispensary, situated in South Fort Street, rapidly grew and its value and success are undoubted.

Such dispensaries are the most effective weapons with which to attack that scourge called Phthisis in its invasion of the working classes, amongst whom so little has been done to treat or cure early cases.

Certainly there are Sanatoria and Hospitals, but little is attempted for the really early case, and small care has been taken to prevent the spread of what is a very infectious diseases. Too long has Phthisis been looked upon as an hereditary disease impossible to cure, and too often is it forgotten that though all forms of Tuberculosis are not infectious Phthisis in its later stages is highly so.

Up/

Up to the present time the Sanatorium has been the chief method of dealing with Phthisis. Fifty years ago these institutions were started for open air treatment but the supply of those to which people of moderate means could hope to go has only met a small percentage of the demand. In the case of the working classes, early cases have often to wait long for admittance to a Sanatorium, and their chance of recovery in many cases has gone by the time they are admitted.

Sanatoria ought to be reserved for patients in the early stages of phthisis who have a real chance of being cured, and not filled with advanced and hopeless cases.

Phthisical cases without a chance of cure should be segregated in special hospitals in order to prevent the spread of the disease as each case is a focus of infection when living at home if proper precautions to guard against infection are not carried out.

I found when visiting advanced cases in Leith that an early case was nearly always to be found in the same dwelling.

At the inception of the South Fort Street Dispensary, the medical practitioners of Leith were notified of its existence, and asked to send any cases/

cases suitable for dispensary treatment.

To popularise Tuberculin we offered to give demonstrations as to the methods used, and to send free to any practitioner who cared to use it, doses of Tuberculin made up as required. This offer of free Tuberculin was taken up to some extent but the amount given away is not growing, and this I am glad to see since I do not think the general practitioner should give Tuberculin as treatment on his own account, unless he has had some extensive experience of its use.

None of the practitioners supplied with Tuberculin really give it a fair trial. Some only gave a few doses and apparently did not care or were afraid to persevere with the Vaccine, and no doubt in their own minds have voted Tuberculin useless.

The Leith School Medical Inspector was invited to send all cases of Phthisis and all suspicious cases. This he did and so greatly enhanced the usefulness of the Dispensary as numerous early cases amongst children were thus caught and treated. Such children can never be had through the hands of the general practitioner as the symptoms being slight in the early stages, these children are seldom examined at home. If

examined/

examined the practitioner fears for many reasons to notify the case as Phthisis till the Bacillus of Tubercle has been found in the Sputum. And there are still numerous practitioners who not only say but firmly believe that Phthisis can not be said to be present till T.B. has been found in the sputum - can there be a more fatuous fallacy.

The greatest of aids to me, however, is compulsory notification. The notification on coming to the Health Office is transmitted to the ~~Health~~ Dispensary and the first emissary sent out is the lady health visitor. She explains about the Dispensary, takes particulars as to the patient's condition, age, habits, occupation, and family history; and takes notes as to condition and size of the dwelling and the number of inmates. Should any person in the house suffer from any chest complaint, bloodlessness or cough, that person is recommended to see a medical practitioner or call at the Dispensary. A leaflet giving causes and methods of prevention of Phthisis is left at the dwelling.

Patients on coming to the Dispensary are examined by me, and according to the condition found, either the patient is treated at the Dispensary or sent to the Phthisis Wards of the Leith Burgh Hospital. The bulk of the patients are treated/

treated at the Dispensary.

Each Phthisis patient receives careful instructions on all points of health and the prevention of infection. Medicine is given according to the condition found, but I place little reliance on such drugs as emulsions and cough mixtures. Tuberculin, I look on as the mainstay in the treatment of those patients. In every suitable case I offer treatment with Tuberculin, and I have never had a refusal.

Doubtful cases receive test doses of Tuberculin. These doses can be given at the patient's own home, but the conditions in an average working class house are not very suitable, especially in the case of children, as one wants to eliminate all causes which might produce a false reaction. We find the best method is to keep a certain number of beds in the Hospital Wards for testing suspicious cases.

Advanced cases which are hopeless as regards treatment are not merely given a bottle of medicine and a sputum flask and forgotten. They are never lost sight of, but are asked to call regularly, every three weeks as a rule, and tactfully reminded as to the ways of preventing infection. The inmates of the same dwelling are examined periodically.

When too ill to attend these patients are visited/

visited from time to time at their own homes, and any help possible is given. Attention to these advanced cases is one of the most important parts of the scheme. It takes up much time, and is often troublesome and thankless, but it must be done and will without doubt prove its value in time to come.

TUBERCULIN.

Tuberculin as a vaccine. It is a direct bacterial product formed by the Tubercle Bacillus. It is introduced to the system to stimulate the production of protective substances called anti-bodies. Thus it differs from a serum which merely neutralises circulating toxin. I used various forms of Tuberculin but all of them may be said to contain the same active principle, only differing in strength and purity. Owing to the method of preparation some of the Tuberculins contain foreign albumin and that substance itself produces a febrile reaction which may be confused with a pure Tuberculin reaction, and this must be borne in mind during treatment. I have found the following to be the most useful of all the various forms of Tuberculin.

a. Koch's Old Tuberculin, Tuberculin Kochi, (T.K.) It is a six weeks old pure culture of human tubercle bacilli grown in 5% glycerine bouillon at 37°C, then evaporated over a water bath to a tenth of its bulk and filtered through porcelain.

T.K. is chiefly used for diagnostic doses.

b. Perlsucht Tuberculin Original. (P.T.O.) is a six weeks old glycerine bouillon culture of Bovine Tubercle Bacilli filtered through porcelain so giving a germ free filtrate.

c/

c. Perlsucht Tuberculin. (P.T.) It is P.T.O. evaporated to one tenth of its bulk. Thus P.T. is analogous to T.K. but is made from Bovine Tubercle Bacilli whereas T.K. is made from the human variety.

I used T.K., P.T.O., and P.T., in the majority of cases at the Dispensary but with some patients these proved unsuitable and other Tuberculins were substituted with good results, so one cannot depend alone on the first named forms.

The other Tuberculins used were

1. Koch's New Tuberculin (T.R.)

2. P.T.R., which is Koch's New Tuberculin made from the Bovine variety of the Tubercle Bacillus.

3. Tubercle Bacilli Emulsion. (T.E.) This is an emulsion composed of powdered human tubercle bacilli suspended in a 50% solution of glycerine. It contains 5 mgrms of solid matter per c.c.

4. Tuberculosis Sero-Vaccine, (S.B.E.) An emulsion of sensitized human tubercle bacilli finely suspended in specific tuberculosis immune serum. The bacilli are combined with immune bodies which combine with the complement of the patient's blood producing bacteriolysis. Thus the dead tubercle bacilli of the S.B.E., are dissolved and the/

the toxins contained in them being liberated stimulate the tissue cells to produce antibodies.

DILUTION OF TUBERCULIN.

For dispensary practice I found it best to make up fresh dilutions for each dispensary day, as the weaker dilutions do not keep well. The pure tuberculin which appears to keep indefinitely can be obtained from the makers in small rubber corked bottles each containing 1 c.c.

For the process of dilution the following apparatus is necessary.

Several 1 c.c. pipettes.

One graduated ten c.c. pipette.

One 1 c.c. pipette graduated to tenths.

One sterilizer long enough to hold the pipettes.

Several halfounce wide mouthed bottles fitted with rubber stoppers.

The diluent except in the case of T.R. and P.T.R., consists of normal saline solution containing ·5% carbolic acid. The carbolic merely acts as a preservative, and is not necessary when fresh dilutions are made up daily.

In the case of T.R. and P.T.R., the diluent is a 25% sterile glycerine solution in water. After sterilizing the pipettes, bottles and corks by/

by boiling, take one c.c. of the pure tuberculin, and to it add 9 c.c. of the diluent. This gives 10 c.c. of a 1 in 10 dilution and if T.K. is being used I label this bottle TK ·1.

Make the second dilution from the first by taking one cc of it and adding 9 cc of the diluent. This would be labelled T.K. ·01 and is a dilution of 1 in 100.

Make a third dilution in a similar fashion from T.K. ·01 getting T.K. ·001, a dilution of 1 in 1000.

Weaker dilutions can then be made if required, in the same manner.

In dispensary practice it depends on the number of patients whether you need more or less than ten c.c. of each dilution as made above but one can always have a fairly accurate idea as to how much is needed and so make accordingly. It is the weaker dilutions which are most used and if 10 cc of the stronger ~~so~~dilutions were made each day there might be some waste. To avoid this take ·3 cc of pure T.K. with the graduated 1 c.c. pipette and to it add 2·7 cc of the diluent thus getting a 1 in 10 dilution and in this case 3 c.c. of T.K.·1. If a special Tuberculin is being used for say one or two patients, and the higher dilution is not required take 1 cc of the pure tuberculin and/

and add 9·9cc of the diluent thus getting a 1 in 100 dilution without making a 1 in 10 first.

In giving doses a hypodermic syringe of 1cc capacity and graduated to tenths, is used. Very accurate doses are thus obtained.

Examples of Doses

·1cc of T.K.·1 (1 in 10) = ·01cc pure T.K.

·2cc " T.K.·1 " " = ·02cc "

·3cc " T.K.·01 (i in 100) = 003cc. "

·5cc " T.K. ·001 (1 in 1000) = ·0005cc T.K.

Site of Injection.

In dispensary practice I found the most convenient site for injecting the dose to be the outer aspect of the upper arm, and if the needle is smartly plunged in at right angles to the skin no pain is felt. I have done this hundreds of times to young delicate children and though a few minutes may have to be spent occasionally to coax them to take the initial dose, I have never had any trouble after that. This I take as a very good proof of the absence of pain.

TUBERCULIN AS AN AID TO DIAGNOSIS.

It is easy to say a patient has phthisis but early cases are difficult to prove, and to feel satisfied in one's own mind, more than slight physical signs are necessary as evidence of the presence of the disease.

It is not right to alarm a patient and the family to which he belongs by stamping him "Consumption" on the evidence of slight signs as some Bronchial Breathing and increased Vocal Resonance found at the Right Apex, yet this too frequently takes place in dispensary practice, and does the patient more harm than good. In those suspicious cases where no Tubercle Bacilli are found in the Sputum, the best guide to a true diagnosis is the tuberculin test, and of the methods practised to operate this test the subcutaneous injection method is the best. It would be good practice where circumstances allow, to test by this method all suspected Phthisis cases where the physical signs and symptoms were not conclusive.

SUBCUTANEOUS INJECTION METHOD.

In this method of diagnosis the patient receives hypodermic injections of definite quantities of Tuberculin Kochi (T.K.) and if the patient is suffering from Tuberculosis, characteristic reactions are/

are produced.

Procedure in Testing by the Subcutaneous Injection Method.

In Leith I am not in a position to test with Tuberculin all doubtful cases but as many as possible are tested in this manner.

Several beds are placed at my disposal in the Burgh Hospital for testing purposes and the average time each test case remains in Hospital is 17 days.

On admittance the patient is put to bed, and the temperature noted at four-hourly intervals for at least two days as the temperature must be running a normal course, and must not range above 98·8°F. before injections are commenced. On no account must antipyretic drugs be used to reduce the temperature. Patients with temperatures higher than 98·8° must remain in bed until it has fallen to the proper level, and it must be such that it remains normal when the patient gets out of bed. In the case of female patients do not give diagnostic doses during the menstrual period.

Koch's Old Tuberculin (T.K.) is the tuberculin used for test doses.

DIAGNOSTIC DOSES.

A sequence of four doses is given. In the case/

case of an adult start with T.K. ·001cc. Should there be no reaction within 48 hours give T.K.·005. If no reaction occurs within another 48 hours give T.K. ·01 followed by another T.K. ·01 after the same lapse of time, if necessary.

The temperature is taken every four hours during the administration of these doses. Should the patient go through the sequence of doses without any reaction he can be said to be "not tuberculosis."

In the case of children and weakly adults the doses used are T.K. ·0001
·0005
·001
·001

REASONS FOR CHOICE OF DIAGNOSTIC DOSES.

In selecting these doses which as diagnostic doses are looked on as large, I was actuated by three chief reasons.

A. It has been proved that twentyfive milligrammes is the amount needed to produce a febrile reaction in a healthy adult.

B. Small doses delay the final result and so are unsatisfactory to patient and doctor.

C. By starting with a small dose and giving say a sequence of five doses with only a small difference in amount between them, a tuberculin tolerance occurs, well seen during treatment with tuberculin, and this leads to the non-appearance of reactions though tuberculosis be present.

Diagnostic Reactions.

These reactions may be three in number.

1. Febrile Reaction.
2. Focal Reaction.
3. Local Reaction.

1. Febrile Reaction.

This reaction to be diagnostic must give a temperature of 100° F or more. With the rise in temperature the patient may complain of headaches and vague subacute pains in various parts of the body.

Rigors/

Rigors, nausea, and vomiting may also occur.

When this reaction occurs it usually does so within 12 hours of the dose but it may be as late as 48 hours.

Besides the temperature reaction either a focal or local reaction or both may occur, the more important of the two being the focal reaction.

The general febrile reaction merely points to the presence of a tubercular condition in the body.

The focal reaction points to the position of the disease in the body.

If the temperature should rise to a point below 100 F°(for example to 99·2 F°) wait until it returns to normal then repeat the <u>same</u> dose and if the slight reaction was due to the Tuberculin a "<u>cumulative action</u>" which is characteristic of the tuberculin reaction, produces a high temperature.

2. <u>Focal Reaction</u> occurs at the site of the tubercular lesion and is indicated in a case of Phthisis by increase of cough and spit, and by increase of crepitations in the diseased area. The focal reaction can be well demonstrated in a case of lupus vulgaris after a dose of tuberculin, the increased inflammation being definitely seen.

3. <u>Local Reaction</u>.

This occurs at the site of the injection.

As/

As a rule only a little redness and swelling occurs which disappears in 24 hours. In most cases it is not greater than that produced by the injection of any such drug as morphia. In a few cases I have noticed the redness and swelling did not start until about 12 hours after the injection and this is difficult to account for. In others the swelling may last for three days but never for longer. Suppuration does occasionally occur at the point of injection but never if due care as to asepsis is taken.

Pseudo-reactions are often obtained in patients of nervous instability. Always give these patients water injections to start with, and keep on with them until they produce no reaction. I find such reactions due to water injections come on mostly during the evening.

CONTRAINDICATIONS.

Contraindications to the use of diagnostic doses are -

1. Existence of Fever.
2. Recent Haemoptysis.
3. Nephritis.
4. Cardiac Weakness.
5. Epilepsy is said to be a contra-indication but I have tested one case unwittingly without/

without apparent trouble.

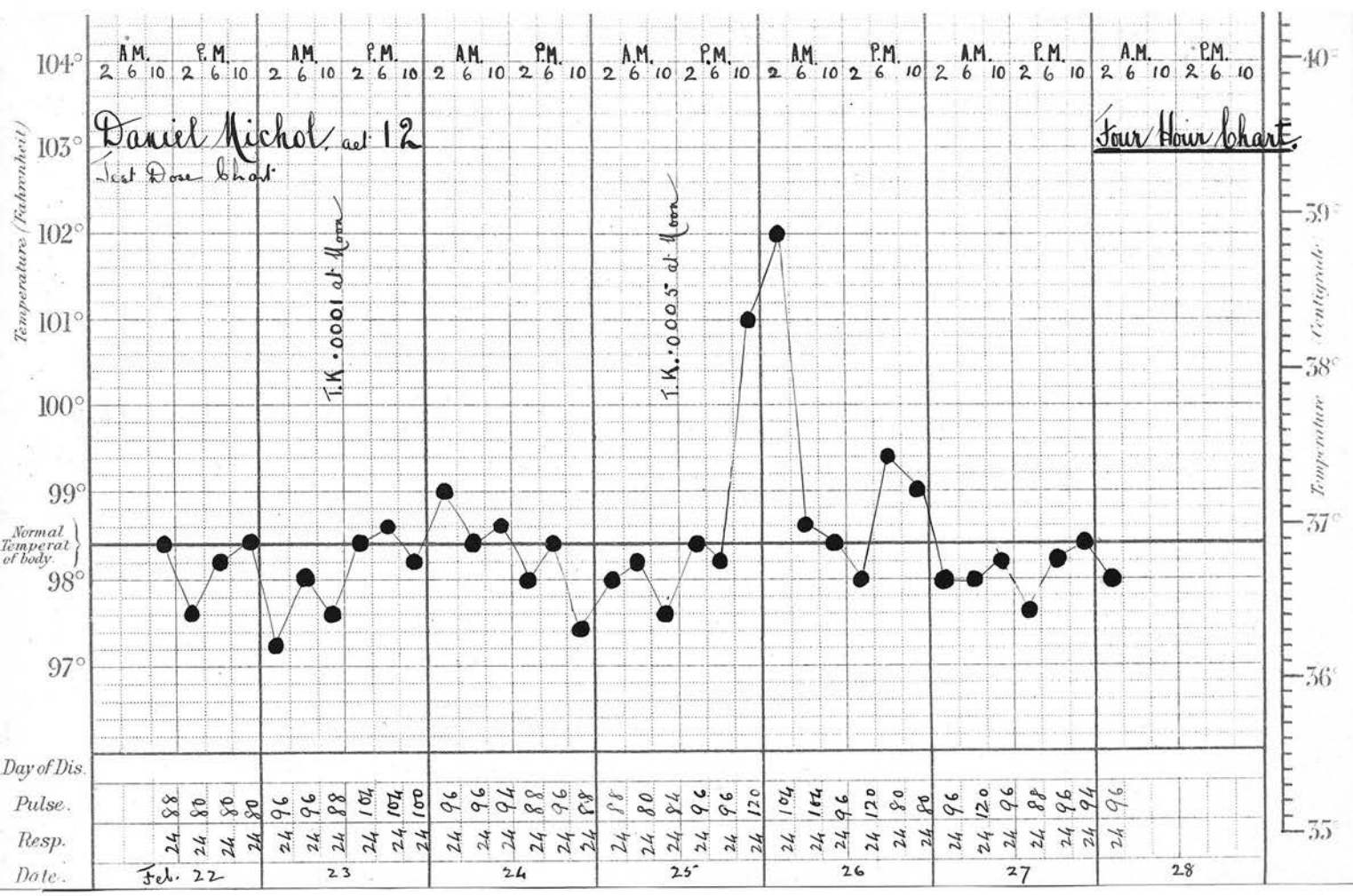
VALUE OF TUBERCULIN IN DIAGNOSIS.

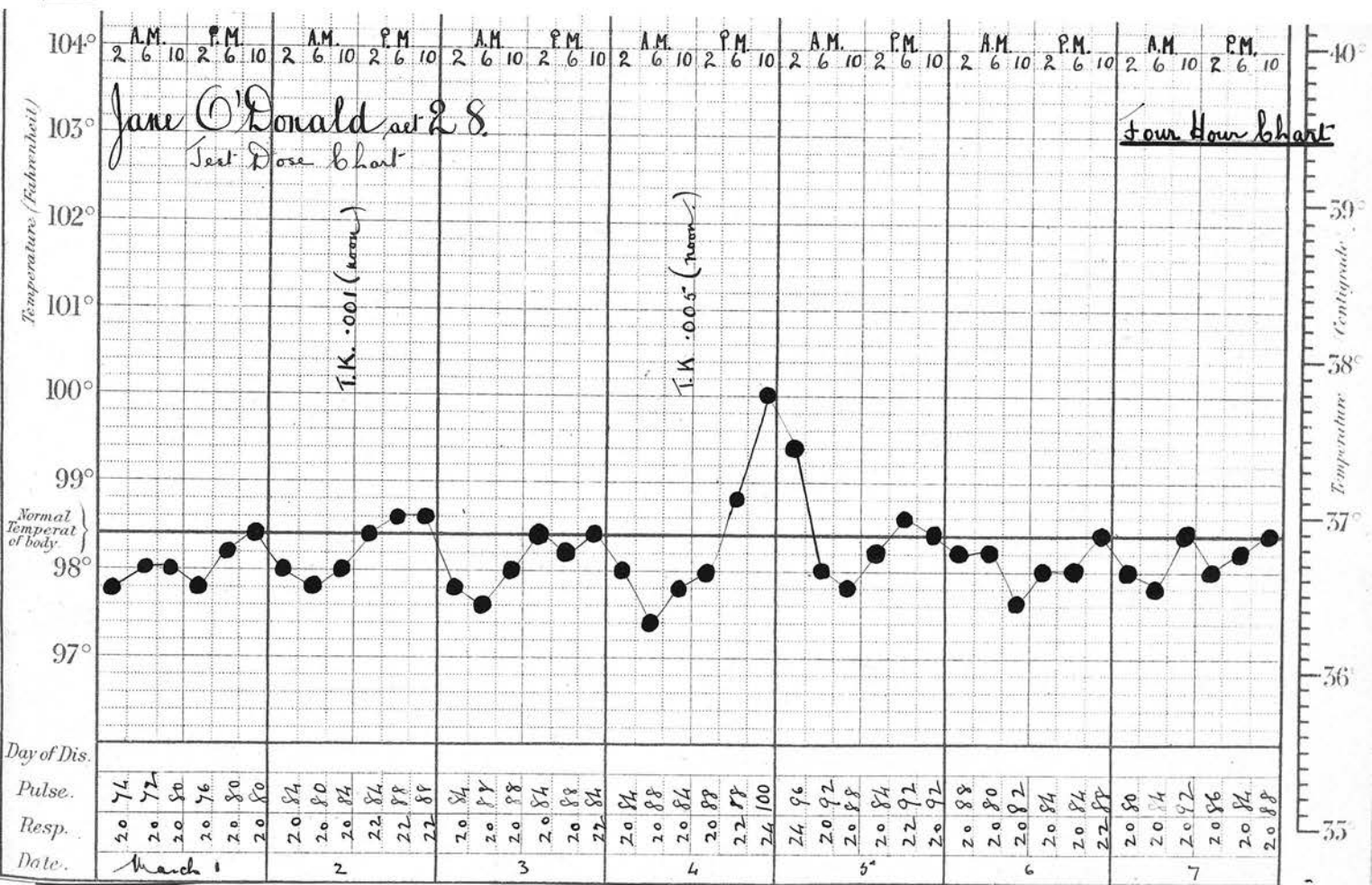
Tuberculin when used in diagnosis must be looked on as an aid only. The result of the test doses must be taken in conjunction with the signs and symptoms and history of the patient in making a diagnosis.

Tuberculin as a diagnostic of active disease is not infallible when used alone. It may produce reactions in cases where the disease is quiescent. But I am here dealing with patients who come with some complaint, and if the signs and symptoms are not conclusive, I test with tuberculin and look on it as a splendid guide to the true diagnosis of active phthisis.

A general febrile reaction shows there is a tuberculous focus in the body. A negative reaction proves we can eliminate tuberculosis.

If a focal reaction occurs, the position of the disease is pointed out, but a focal reaction is not common. Looked on as a guide to diagnosis Tuberculin is of immense value and cannot be done without in dispensary practice. It must however only be used where doubt exists and if this were done we would hear no more of the risks and dangers which are supposed to attend its use in diagnosis.


Daniel Michol, aet 12
Test Dose Chart
Four Hour Chart
T.K. ·0001 at Noon
T.K. ·0005 at Noon
Temperature (Fahrenheit)
Temperature Centigrade
Normal Temperat of body
A.M. P.M.
2 6 10 2 6 10
104° 103° 102° 101° 100° 99° 98° 97°
40° 39° 38° 37° 36° 35°
Day of Dis.
Pulse.
Resp.
Date.
Feb. 22 23 24 25 26 27 28


Jane O'Donald, aet 28.
Test Dose Chart
Four Hour Chart
T.K. ·001 (noon)
T.K. ·005 (noon)
Temperature (Fahrenheit)
Temperature Centigrade
Normal Temperat of body
A.M. P.M.
2 6 10 2 6 10
104° 103° 102° 101° 100° 99° 98° 97°
40° 39° 38° 37° 36° 35°
Day of Dis.
Pulse.
Resp.
Date.
March 1 2 3 4 5 6 7

Examples of Diagnosis by means of Tuberculin.

Case 1. Daniel Nichol, aet 12, sent to the Dispensary by the School Medical Inspector at the beginning of February 1912.

Complaint. Cough: Loss of weight: Night sweats.

Physical examination shewed some slight dulness and broncho-vesicilur breathing at the right Apex.

History. Sister died of Phthisis Jan. 1912.

Sputum. T.B.-

Albumen. Nil.

I sent this boy into Pilton Hospital where I gave him test doses and obtained a positive reaction with T.K. ·0005. The "cumulative action" will be noted in the chart appended.

Case 2. Jane O'Donald, aet 28.

Complaint. Cough: Loss of weight: Night sweats.

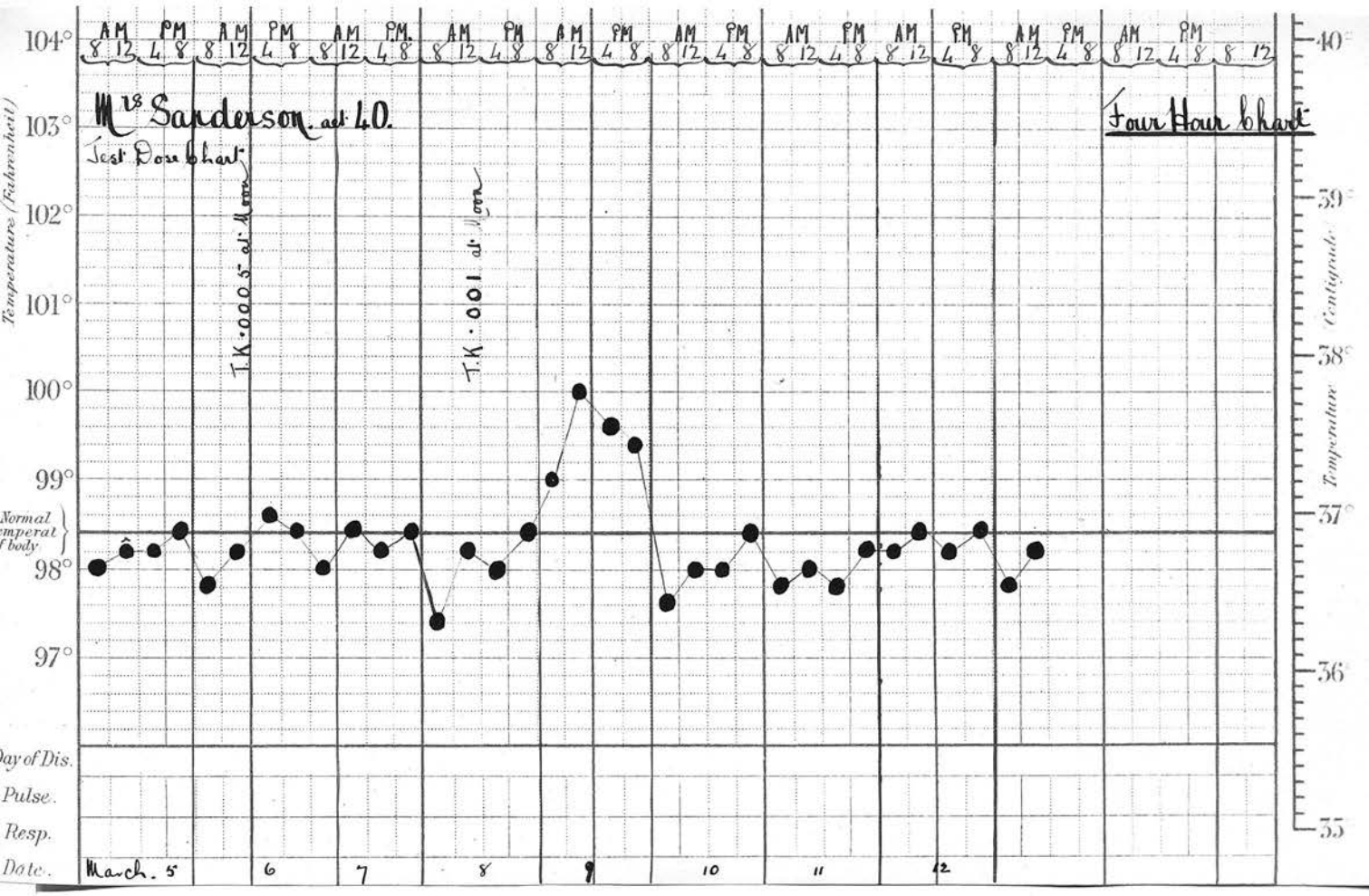
Physical examination shewed some signs of Phthisis at the left apex.

History. Nothing of note.

Sputum. T.B.-

Albumen. Nil.

Two doses only were necessary to prove this case/


Mrs Sanderson. ad 40.
Test Dose chart.
Four Hour chart
T.K · 0005 at Noon
T.K · 001 at Noon
AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12 PM 4 8 AM 8 12
104°
103°
102°
101°
100°
99°
98°
97°
40°
39°
38°
37°
36°
35°
Temperature (Fahrenheit)
Temperature Centigrade
Normal Temperat of body
Day of Dis.
Pulse.
Resp.
Date.
March. 5
6
7
8
9
10
11
12

case positive, a temperature of 100° F. being obtained with T.K.·005 as shown in the chart.

Case 3. Mrs. Sanderson aet. 40.

This case was notified by the Edinburgh Dispensary and came to Leith Dispensary through the Lady Health Visitor. She complained of having had a cough for some years and she felt "run down".

Physical examination shewed some signs of Phthisis at the Right Apex including a few crepitations.

History. Nothing of note.

Sputum. T.B -

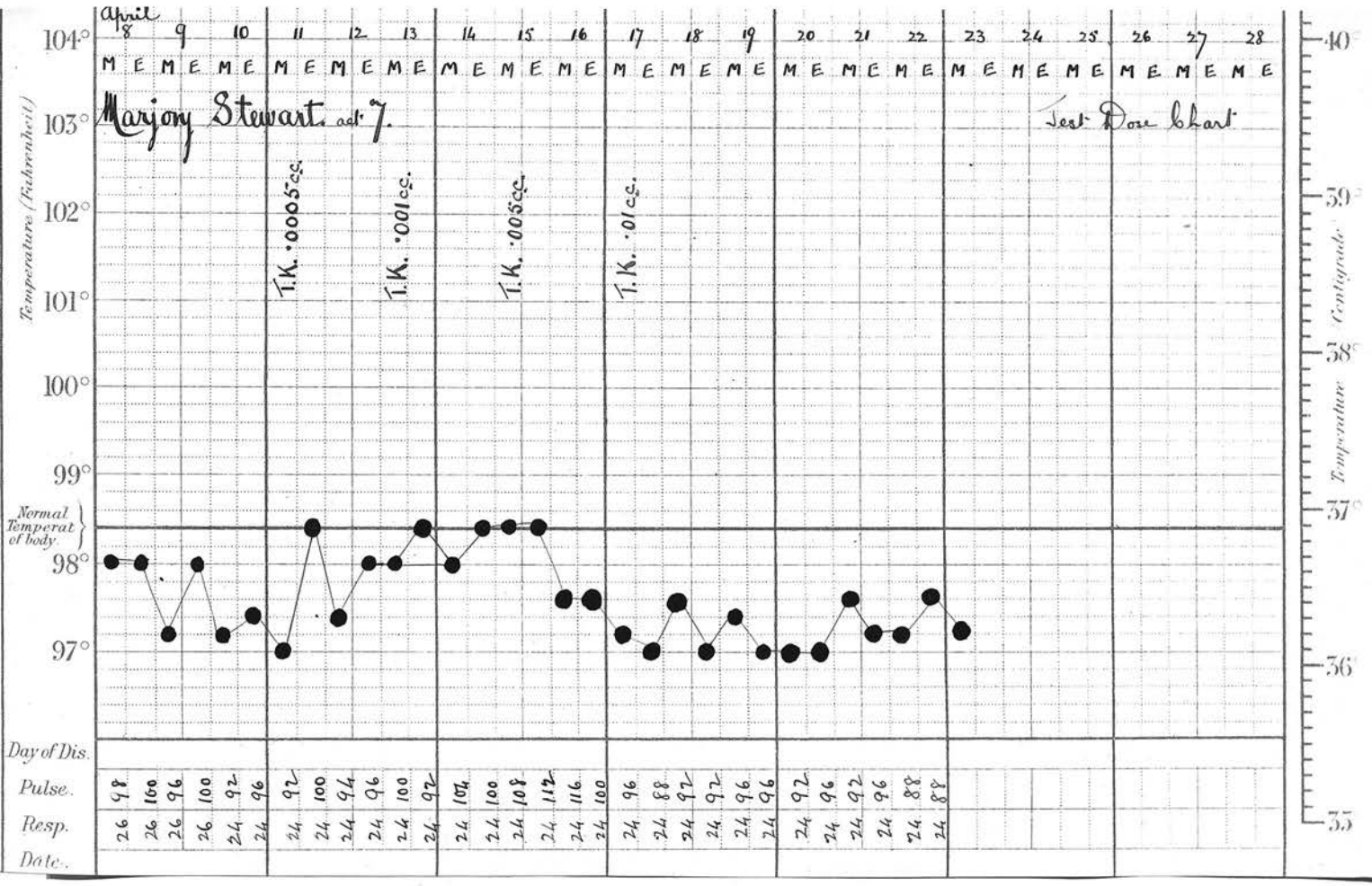
Albumen. Nil.

This case was one of a series I tested in their own home. I did not confine her to bed but allowed her to be up and do light house-work.

She took her own temperature every four hours during the day.

I append her chart and it will be seen I obtained a positive reaction with T.K. ·001. The febrile reaction of 100° F. was accompanied by a focal reaction at the right apex, the crepitations being clearly increased and the cough more troublesome.

Only selected cases can be tested at home since everything likely to produce a pseudo-reaction must/


April
8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28
M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E M E
Marjory Stewart. aet. 7.
Test Dose chart.
T.K. ·0005 c.c.
T.K. ·001 c.c.
T.K. ·005 c.c.
T.K. ·01 c.c.
Temperature (Fahrenheit)
104°
103°
102°
101°
100°
99°
Normal Temperat of body.
98°
97°
Temperature Centigrade
40°
39°
38°
37°
36°
35°
Day of Dis.
Pulse.
Resp.
Date.
98 100 96 100 92 96 92 100 94 96 100 92 104 100 108 112 116 100 96 88 92 92 92 96 92 96 88 88
26 26 26 26 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24 24

must be eliminated and the patient must be intelligent enough to take the temperature every four hours.

In several instances I tried children with test doses at home, but I could never feel sure that I was getting a true tuberculin reaction. Children of the working classes must be taken into hospital for test doses.

Case 4. An example of a case which gave a "negative reaction."

Marjory Stewart aet. 7 years.

Complaint. Cough and loss of weight.
Physical examination shewed slight dulness and bronchial breathing with increase of vocal resonance at the Right Apex.

History. Her mother suffers from Phthisis.

Sputum. None.

Albumen. Nil.

This child received four doses of T.K. as seen by her chart, up to the comparatively large dose of T.K. ·01cc, but no reaction of any kind was produced. I had therefore no hesitation in saying she was free from Tuberculosis. I examined her six months later and found her in good health.

ACTION/

ACTION OF TUBERCULIN.

Tuberculin has little if any effect on the nontubercular whilst in the tubercular a very small dose produces reaction. The varieties of Tuberculin are many, but though each may have some special property of its own, all have certain similar effects. Each protects itself against the other but not so much as against itself. In all tuberculins there is an active common substance and it is owing to this that good results can be obtained with any tuberculin if used in a proper fashion. Many theories have been expounded to explain the action of tuberculin, but that applied by Wolff-Eisner is probably the best. He assumes that tuberculin is a foreign albuminous substance which is lysinized in the body by a specific lysin. This lysinisation splits up the large albuminous molecule into smaller molecules of high toxic power which in turn produce the local and general tuberculin reactions. The non-tubercular patient does not contain in his body at the time of injection this specific lysin necessary for the splitting up of the Tuberculin molecule. On the other hand, the body of the tubercular patient contains the specific lysin as it has been formed by the tissues stimulated by the tuberculin produced in the tuberculous focus.

Hence/

Hence the reason for the presence or absence of reactions in the tubercular and non-tubercular respectively. The general reaction is due to the general action of the lysinized tuberculin on the circulation.

The focal reaction is due to the irritative action of the lysinized tuberculin on the focus.

Repeated injections into a healthy person ~~person~~ may produce a reaction because the early doses stimulate the tissues to produce the lysin and this lysin digesting the later doses of Tuberculin gives lysinized tuberculin and a consequent general reaction. This point must be borne in mind when a course of numerous small doses is suggested in diagnosis by means of tuberculin.

THERAPHY.

Tuberculin used in the treatment of Tuberculosis must be looked on as an aid only, but as an aid of great power.

Tuberculin is not a specific; it is not an anti-tuberculosis serum. It is a vaccine and as such is injected into the body to stimulate the tissues to react and form antibodies in sufficient quantities to cope with the poisons of tubercle and so allow the body to overcome the tubercle bacillus.

In some cases tuberculin by itself will without doubt effect a cure, but it will cure a greater perdentage of cases when it receives some help. The help I refer to is Hygiene.

Thus well managed Sanatoria kept for early cases are ideal for giving treatment with Tuberculin.

But all early cases cannot get into Sanatoria. Personally I know of several patients in one county who have been waiting for six months to get into a Sanatorium under the Insurance Act. It is not pleasant to speculate on what they have lost in that six months. Had these patients been given Tuberculin treatment at a Dispensary as is done in Leith on their condition being known, their chance of recovery would have been as good as if they had been/

been taken into the Sanatorium at once. From the Dispensary, patients can be given tuberculin treatment without delay. The patient comes twice a week for his dose. At home he has to take and record his own temperature and though he knows nothing of the action of the vaccine he feels something is being done for him.

He is instructed as to the value of fresh air, plain nourishment, moderate exercise and tepid baths, and he is warned against excesses of all kinds.

Occasionally a visit is paid to his home and he is encouraged in every way to obey the laws of health.

Instructions given to the average adult patient of the working class are useless unless you stimulate a self interest. I claim that the Dispensary by giving treatment with Tuberculin produces the self interest and this leads to the carrying out of the hygienic instructions with a faithfulness which is surprising to anyone who has worked amongst that class of the population.

Tuberculin dispensaries will be the future means of educating the working-class masses to the dangers of Phthisis and that education is necessary before the disease can be eradicated.

CASES SUITABLE FOR TREATMENT WITH TUBERCULIN FROM A DISPENSARY.

Phthisis cases suitable for treatment with Tuberculin may be divided into two groups.

A. Those treated in the hope of arresting the disease and once more making the patients useful citizens.

B. Those past the possibility of cure but whose symptoms may be mitigated.

GROUP. A

In this group it must not be forgotten that the aim is to arrest the disease. New lung tissue cannot be made by the aid of tuberculin. The disease is stopped and nature heals up the wound in the lung with fibrous tissue.

What cases can be cured by means of Tuberculin?

Cases in the early stages of the disease are the proper cases for treatment because at this stage tuberculin exerts its full action and can effect certain cures. By early cases I mean all those coming under Class I in Turban's Classification.

Do not select cases in the early stages but treat them all with Tuberculin. They cannot all take the same doses but I have found no two cases to be alike in the amount of Tuberculin which can be borne.

The/ only

The only exception I make to this course is the case of acute Phthisis - the case which advances rapidly and death occurs in a few weeks. Such a patient cannot be treated with Tuberculin.

Early cases shewing a febrile condition are rested in bed for a few weeks in order to have the temperature running a fairly normal course. I do not like to keep patients in bed during treatment but that may be necessary in some febrile cases.

Cases coming under Class II. of Turban's Classification, I treat with Tuberculin as a rule if they are uncomplicated and afebrile.

Cases where there is a mixed infection have to be judged on their own merits because Tuberculin can exert no curative action on secondary purulent processes caused by streptococci and other organisms, and as a rule the patient's body is too weak to react well to the Tuberculin.

Therefore it depends on the general condition of the patient whether Tuberculin may be tried or not in cases of mixed infection.

To put the matter broadly I say that every uncomplicated case of Phthisis should receive treatment with Tuberculin.

GROUP B.

Where/

Where recovery is impossible but symptoms may be mitigated.

Some forms of Tuberculin have a remarkable effect in mitigating symptoms. Dry cough may be greatly diminished. Thick sputum may be rendered more fluid and consequently expectoration easier.

Pleuritic pain may be reduced.

Headaches, Dyspnoea, and Sweating may all be reduced.

Though many affect to believe that the relief of all or any of these symptoms in advanced cases is due to the action of mind on body, yet I think there is little doubt it is due mainly to focal reactions in the lung and partly to the general reaction. Secretion is made more fluid and consequently coughing is made less difficult. Most of the symptoms relieved can be traced back to the act of coughing. By easing these symptoms the patient is made to both look and feel better.

To be able to give patients some relief in the later stages of Phthisis makes Tuberculin a very useful drug and even were that its only use it could not be done without.

TREATMENT OF CASES OTHER THAN PHTHISIS

Besides/

Besides treating cases of Phthisis I have had marked success in treating with Tuberculin other tuberculous cases, as Lupus Vulgaris, Opthalmic Disease and Diseases of Bones and Joints. I shall later give examples of these.

CONTRA-INDICATIONS TO THE USE OF TUBERCULIN IN DISPENSARY PRACTICE.

1. Fever. (a) If due to a mixed infection it is not advisable to treat at once from the dispensary. It is much better to send such cases into hospital where minute doses should be tried as the tuberculin may exert an indirect action on the fever. If they do well in hospital the treatment may be later continued from the dispensary.

(b) Where the fever is due to absorption of the toxins of tubercle baccili rest the patient in bed until it abates sufficiently to go on with the treatment.

2. Debility. If the patient is much emaciated and his body strength much reduced I send him into Pilton Hospital for three months and start treatment there. On his discharge from the hospital I keep on with the treatment from the Dispensary if I find the Tuberculin is doing good.

3. Haemorrhage. I always allow a month to elapse after haemoptysis before commencing treatment, and during treatment of such a case I am always very cautious about increasing the doses at the commencement. If haemoptysis occurs during treatment I send the case to Hospital for a month or give a rest at home for five weeks before commencing treatment again.

4./

4. Morbus Cordis. If compensation is complete I do not think there is any danger in going on with treatment. If it is not complete the danger of collapse and disturbance of compensation due to febrile reaction and toxic absorption, is present.

Cases of incomplete compensation must therefore be treated with extra precautions as to increase of dose, if treated at all.

5. Albuminuria. The Urine is tested before commencing treatment and from time to time during treatment. I look on Albuminuria as a contra indication to tuberculin treatment in dispensary practice as the dangers of tuberculin aggravating the condition are great.

6. Hysteria. Give all hysterical patients a course of water injections before commencing with tuberculin. The febrile reactions produced by water in these cases have to be seen to be believed.

7. Pregnancy. In dispensary practice I stop treatment merely as a matter of good policy, at the sixth month of pregnancy, but I believe the treatment could be carried on to full time without harm either to the mother or the unborn child.

GENERAL TECHNIQUE AND PRINCIPLES OF TUBERCULIN TREATMENT AT THE DISPENSARY.

The diagnosis having been made, treatment may be commenced at once, but first the patient is taught to use a thermometer, and he practises this for a week, night and morning, bringing his record to the dispensary on a sheet of paper. Meanwhile the urine is tested for albumin.

METHOD.

The Tuberculin is given by means of subcutaneous injections and the patient's ordinary routine is not interfered with. He merely comes to the Dispensary twice a week for injections and is free to go about his ordinary work and duties during the rest of the week. I have had numerous cases where the patients were at work during the whole course of their treatment.

By the subcutaneous injection method the exact dose is known and can be increased in an exact proportion from time to time, and as the patient's ordinary routine is not interfered with, any autoinoculation of tuberculin is neither increased nor diminished. In the method where tuberculin is given by autoinoculation the dose is governed by other factors besides exercise and the ends of carefully graduated exercise are defeated by such things as/

as excitement, a full meal, or disturbed sleep. Any one of these may produce autoinoculation so that it is not possible to guage the dose administered when autoinoculation is relied on alone.

ASEPSIS.

The site chosen for the injection must be cleansed by means of cotton wool and spirit. This is very necessary in dispensary practice though it is not carried out in all sanatoria. I keep several hypodermic needles in constant boiling water during the dispensary hours and use a clean needle for each case.

I boil the syringe once a day.

After injection the puncture is covered with cotton wool and collodion.

SITE OF INJECTION.

For convenience in dispensary practice I find the outer aspect of the upper arm the most convenient site. It is said that less local reaction is obtained if the injection is made into the skin between the shoulder blades, but my percentage of local reactions has not been great so I continue to make the upper arm the site of injection.

I believe many local reactions are due to injecting the tuberculin into the true skin and would occur with any drug. The injection must be made/

made into the tissue between the skin and the fashia. Plunge the needle well in at right angles to the skin when no pain is felt and there is no chance of making the injection into the skin itself.

OBSERVATIONS TO BE MADE IN DISPENSARY PRACTICE.

(a) Temperature, which is taken regularly by the patient night and morning.

(b) Weight. The patient is weighed on every visit to the Dispensary.

(c) General Health especially with regard to

Appetite.

Sleep

Cough

Indefinite Pains.

The chest is examined every month during treatment.

The sputum is examined from time to time.

LENGTH OF COURSE OF TREATMENT.

No time can be fixed. Continue as long as improvement continues or until the patient is cured.

I usually give to an adult a course of P.T.O. followed by P.T. and then give the patient a rest of three months. At the end of that time if the disease is not quiescent I may give him another course.

I may follow the P.T. at once with a course of T.K. and have done so in some cases.

After the course is finished the patient should return/

return periodically for examination and if necessary he may be tested with test doses.

To give a course of P.T.O. takes at least eight weeks and the combined course of P.T.O. and P.T. takes at least 14 weeks. I have found the average time for a course of P.T.O. is three monthsand for the combined P.T.O. and P.T. five months.

INITIAL DOSE.

My initial dose in the case of an average adult is P.T.O. ·001. To a weakly adult or young person I start with P.T.O. ·0001 and to a child under seven years of age I give P.T.O. ·00001.

SUBSEQUENT DOSES.

In an ideal case where the febrile reaction is never above 99·2°F. and the patient improves steadily in every respect I mount up the dosage ladder in the following way, a dose being given twice a week.

Initial dose	P.T.O.	·001 followed by
	P.T.O.	·002
	"	·004
	"	·006
	"	·008
	"	·01
	"	·02
	"	·04
	"	·06
	"	·08
	"	·1
	"	·2
	"	·4
	"	·6
	"	·8
	"	1 cc

After getting to 1cc of P.T.O. I go on to P.T.

Theoretically/

Theoretically P.T. should be 10 times stronger than P.T.O. but practically it is found to be forty or fifty times stronger, so that after 1cc of P.T.O. I give P.T. ·02 and mount up in the same way as with P.T.O.

P.T. ·02
" ·04
" ·06
" ·08
" ·1
" ·2
" ·4
" ·6
" ·8
" 1cc

In the case of young children I never go beyond 1cc P.T.O.

To weakly adults and children over 13 I may give up to 1cc of P.T.

With average adults I stop also as a rule at 1cc P.T. but if they are doing well and I think they would benefit, I go on to T.K. starting with ·04 and going up to 1cc in the ordinary way.

MAXIMUM DOSE.

1cc of T.K. is the maximum dose which should be given to any patient.

GENERAL PRINCIPLES IN DOSAGE.

No definite rules can be laid down for dosage of tuberculin in treatment, but the following may be taken as a guide.

Doses are given twice a week, say Monday and Thursday or Tuesday and Friday.

Rapidly increase the doses to a maximum, but not too rapidly as to produce the great reactions sought for by some authorities.

I never like a febrile reaction over 99.2° F but mild reactions do good and should be aimed for.

Modify or increase the dose according to the reaction or the condition of the patient. As long as the febrile reaction is not over 99.2°F go on increasing the dose. If between 99.2° and 100° wait a week and repeat the last dose or give a slightly smaller dose than that which produced the reaction of over 100°F.

If a dose produces much local reaction do not give another until the inflammation has subsided, then repeat the last dose.

Never let more than ten days elapse between doses, but if for any reason injections are stopped for say, three weeks, start with a dose equal to a quarter of the last dose injected.

If the patient is losing weight during treatment,

go/

go slowly but do not diminish the dose unless absolutely necessary. I have found, in some cases, that the same dose repeated several times produces loss of weight but if I boldly increase the dose, the weight increases also.

Patients in the early stages of the disease are on the whole more sensitive to tuberculin than those in advanced stages, but once early cases get a start you can mount the dosage ladder quickly without getting any reactions. In more advanced cases one can not mount so quickly without getting reactions.

Do not be too cautious at the commencement of treatment especially with early cases. With the first doses a hypersensitiveness often occurs, shown by big reactions. Remember this and do not continue giving the same dose when you get these reactions, but overcome the hypersensitiveness by increasingthe dose.

This hypersensitiveness in some cases is extremely resistant, but in spite of this one gets improvement, which is shown by the patient feeling better and putting on weight.

Exercise patience and remember the object is to produce active immunisation and arrest the progress of the disease.

ILLUSTRATIVE CASES.

I shall now give short notes on twelve cases to illustrate tuberculin treatment at the Dispensary.

Case 1. An example from many of a case successfully treated from the Dispensary without resource to the Hospital.

Case 2. A case tested in Hospital and treated from the Dispensary.

Case 3. A child of seven who attended school regularly during treatment.

Cases 4 & 5. Test doses given and treatment commenced in Hospital and ~~treated~~ continued from the Dispensary.

Case 7. Young adult attending work whilst undergoing treatment from the Dispensary.

Case 8. Shewing how one Tuberculin was quite unsuitable while another was readily taken.

Case 9. Tuberculin in treatment of Lupus Vulgaris.

Case 10 & 11. Tuberculin in treatment of Phlyctenular Conjunctivitis.

Case 12. Tuberculin in treatment of Scrofuloderma.

Case 1. Treated from the Dispensary without resource to the Hospital.

Jane Davidson, aet. 13.

Complaint Cough and Spit: Loss of Weight.

Physical examination. Distinct evidence of Phthisis at Right Apex.

Sputum T.B-

Albumen Nil

History Nothing of note.

I decided to treat this girl with tuberculin and started with P.T.O. giving ·0001cc as the initial dose. I carried on the treatment to 1cc of P.T. only once getting a febrile reaction. This reaction occurred after P.T. ·08cc, when an evening temperature of 99·4°F was produced with some local reaction. I did not however, reduce the dose after that reaction but kept on increasing it.

The following is a list of her doses:-

Date	Dose	Weight.
27th Feb. 1912	P.T.O. ·0001cc	5st. 5¼lbs
1st Mar. "	" ·0002 "	5 " 5¾ "
5th Mar. "	" ·0004 "	5 " 6½ "
8th Mar. "	" ·0006 "	5 " 7 "
12th " "	" ·0008 "	5 " 6 "
15th " "	" ·001 "	5 " 6 "
19th " "	" ·002 "	5 " 6½ "
22nd " "	" ·004 "	5 " 6 "
26th " "	" ·006 "	5 " 6½ "
29th " "	" ·008 "	5 " 6½ "
2nd April "	" ·01 "	5 " 7 "
5th " "	" ·02 "	5 " 7 "
9th " "	" ·04 "	5 " 7 "
12th " "	" ·06 "	5 " 7½ "
16th " "	" ·08 "	5 " 6 "

-----Evening temperature of 99·4° and arm painful ----

19th/

Date	Dose	Weight
19th April 1912	P.T.O..1c.c.	5 st. 6 lbs.
23rd " "	" .2 "	5 " 6 "
26th " "	" .4 "	5 " 6 "
30th " "	" .6 "	5 " 7 "
3rd May "	" .8 "	5 " 7 "
7th " "	" 1 "	5 " 7½ "
10th " "	P.T. .02 "	5 " 7 "
14th " "	" .04 "	5 " 6¾ "
17th " "	" .06 "	5 " 7 "
21st " "	" .08 "	5 " 7¼ "
24th " "	" .1 "	5 " 8 "
28th " "	" .2 "	5 " 8 "
31st " "	" .4 "	5 " 8½ "
4th June "	" .6 "	5 " 9 "
7th " "	" .8 "	5 " 8¾ "
11th " "	" 1 "	5 " 9 "

Since March 1912 this girl has steadily improved. She has lost her cough, gained weight and has a healthy appetite. When last examined the disease was quiescent. She visits the Dispensary from time to time for re-examination.

Case 2.

Tested in Hospital and treated from Dispensary.

Elizabeth Mackay, aet. 13.

Complaint. Growing thinner since September 1911.

Cough and spit.

Physical examination. Right Apex shewed dulness, bronchial breathing, increase of local resonance and fremitus and a few crepitations.

Sputum T.B.-

Albumen Nil.

History. Diphtheria seven years ago which left right arm paralysed.

I took this case into Pilton Hospital for test doses. Starting doses with T.K. .0001c.c. on 2nd March/

SANATORIUM CHART.

Extending over 3 months.

NAME & AGE Elizabeth Mackay. aet 13

DATE

~~CASE BOOK No~~ Hospital Treatment. Dispensary Treatment.

NORMAL WEIGHT

HEIGHT

CHEST { INSPIRATION / EXPIRATION

Test Doses.

1912 Feb. March April May

Date: 28 29 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 31 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16 17 18 19 20 21 22 23 24 25 26 27 28 29 30 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16

M E M E M E

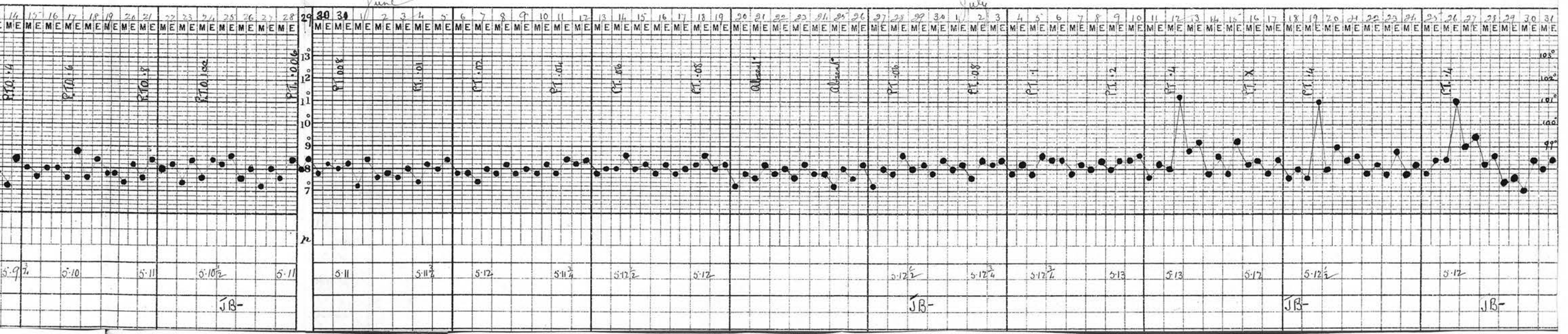
ION .....
ON .....

NAME & AGE .....
DATE .....
CASE-BOOK No .....

SANATORIUM CHART.

Extending over 3 months.

NORMAL WEIGHT .....
HEIGHT .....



March, no reaction was produced, but T.K.·0005 given on 4th March produced a temperature of 100°F.24 hours later accompanied by some local reaction.

I diagnosed Phthisis on the aiding evidence of this reaction and decided to commence treatment with Tuberculin at once.

I gave the first few doses of treatment in Hospital, keeping the patient there altogether about four weeks.

I commenced treatment with P.T.O. ·0001c.c. on the 11th March and had no reactions until P.T.O. ·001 c.c. when an evening temperature of 99°was given.

After 1c.c. of P.T.O. reached on 24th May, P.T. was substituted and the dosage ladder was mounted in the usual way and without reactions until the relatively high dose of P.T. ·4c.c. was reached. That dose given on 12th July produced an evening temperature of 101·2°. I gave no dose on the 16th July but repeated P.T. ·4c.c. on the 19th and had a resulting evening temperature of 101°. I allowed a week to elapse and tried the same dose again with the same resulting temperature and on this occasion accompanied by much sickness and headache.

In this case the maximum dose had been reached and I stopped tuberculin treatment.

The girl has done very well ever since. The disease is quiescent and she is in a healthy condition.

Her weight during treatment increased from

5/

5st. 3¾ lbs. to 5st.12 lbs.

Case 3.

Attending school during treatment.

Henry Grey, aet. 7.

Complaint, Slight Cough; no sputum.

Physical Examination shewed some signs of Phthisis at Right Apex.

Sputum None.

Albumen Nil.

History Nothing of note.

This case was notified as Phthisis by the Edinburgh Dispensary and came to me through the Lady Health Visitor.

He went right through a course of P.T.O. without a single reaction and attended school throughout the treatment.

He gained only one pound in weight, but his mother said his appetite improved about a month after the course of injections was started and that judging by her own experience of him he had never been in better health.

Date	Dose	Weight.
29th March 1912	P.T.O. ·0001c.c.	3st.5 lbs.
2 April "	" ·0002 "	3 " 5 "
5th " "	" ·0004 "	3 " 5¾ "
9th " "	" ·0006 "	3 " 5¾ "
12th " "	" ·0008 "	3 " 5 "
16th " "	" ·001 "	3 " 5 "
19th " "	" ·002 "	3 " 4 "
23rd " "	" ·004 "	3 " 4 "
26th " "	" ·006 "	3 " 5 "
30th " "	" ·008 "	3 " 4 "
3rd May "	" ·01 "	3 " 4¾ "
7th " "	" ·02 "	3 " 4 "

Missed/

Missed several days as his mother was working away from home and could not bring him to the Dispensary.

Date	Dose	Weight
21st May 1912	P.T.O. ·006c.c.	3st. 5 lbs.
24th " "	" ·008 "	3 " 5 "
28th " "	" ·01 "	3 " 5½ "
31st " "	" ·02 "	3 " 5¼ "
4th June "	" ·04 "	3 " 5 "
7th " "	" ·06 "	3 " 5½ "
11th " "	" ·08 "	3 " 5 "
14th " "	" ·1 "	3 " 5 "
18th " "	" ·2 "	3 " 5½ "
21st " "	" ·4 "	3 " 5¾ "
25th " "	" ·6 "	3 " 5¾ "
28th " "	" ·8 "	3 " 6 "
2nd July "	" 1 "	3 " 6 "

This child is still gaining weight and the disease is quiescent.

At present he is attending school regularly and is in the best of health.

Cases 4 & 5.

Test doses given and treatment commenced in Hospital and continued from the Dispensary.

Case 4.

James MacKintosh, aet. 13.

Complaint Cough and copious spit.

Physical examination shewed some signs of Phthisis at Right Apex.

Sputum T.B.-

Albumen Nil.

History Nothing of note.

This/

SANATORIUM CHART.

Extending over 3 months.

NAME & AGE James MacKintosh. aet: 13.

DATE 1st March 1912.

CASE-BOOK Nº

CHEST { INSPIRATION / EXPIRATION

NORMAL WEIGHT

HEIGHT

Test Doses.

Hospital Treatment.

Dispensary Treatment.

1912 March April May

Date

F 103° 102° 101° TEMP. 100° 99° 98° 97°

T.K.0001 T.K.0005 Loaded Tuberculin P.T.O.0001 P.T.O.0003 R.T.O.0006 P.T.O.0001 P.T.O.0002 P.T.O.0004 P.T.O.0006 P.T.O.0008 P.T.O.0006 Discharged from Hospital P.T.O.0002 P.T.O.0004 P.T.O.0006 P.T.O.0008 P.T.O.0001 P.T.O.0002 Wasn't P.T.O.0004 P.T.O.0005

Pulse

Respiration

B. O.

Weight in Stones & lbs. 4-6 4-5 4-2½ 4-3¾ 4-4 4-4 4-4½ 4-4½ 4-4½ 4-5 4-5 4-4¾ 4-5 4-5½ 4-6

Sputum J.B.- J.B.- J.B.-

NAME & AGE

DATE

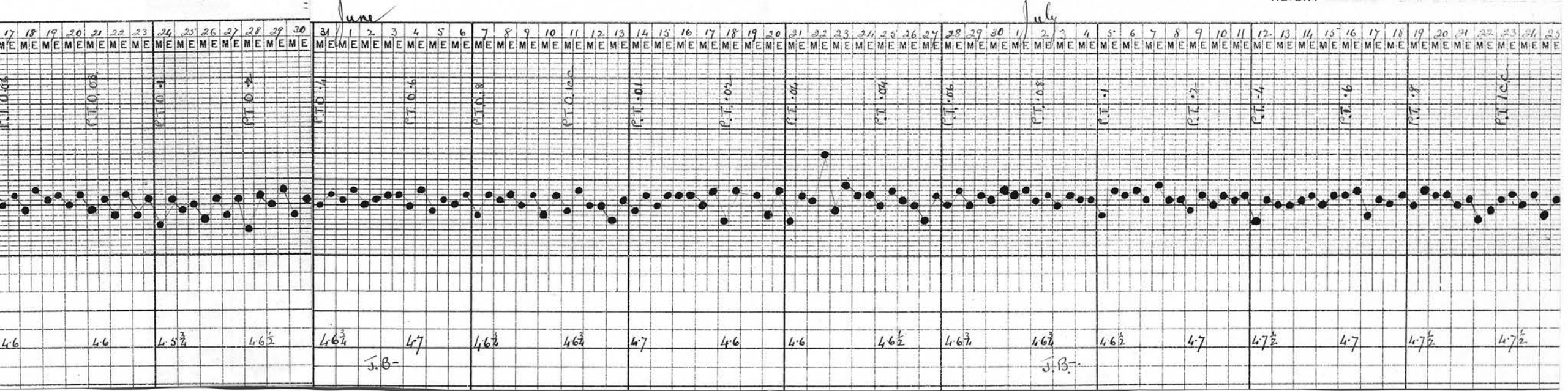
CASE-BOOK Nº

SANATORIUM CHART.

Extending over 3 months.

NORMAL WEIGHT

HEIGHT



This boy was sent from the Dispensary to Pilton Hospital and I started test doses on March 3rd by giving him T.K. ·0001c.c. Getting no reaction I gave him ·0005c.c. on 5th March and 24 hours later obtained a temperature of 102°F.

I started treatment on March 13th with P.T.O. ·0001cc and increased the doses in the usual way. With P.T.O. ·008c.c. given on the 11th April there was a reaction of·99°4° so that dose was repeated on the 17th.

He left Hospital on the 18th and attended the Dispensary on the 19th April. I deemed it judicious to start with a smaller dose than the last he had in Hospital, thus on the 19th April he had ·002c.c. From there I took him through P.T.O. and up to P.T. 1c.c.

I append his chart shewing doses, temperatures and weights. The disease is quiescent and he is doing well.

Case 5. James Simpson. aet. 13.

Complaint. Getting very thin during the last six months and in bed all the time.

Cough and Spit very troublesome: Night sweats.

Physical examination shewed some signs of Phthisis at the Right Apex.

Sputum. T.B.-

Albumen. Nil.

History. Nothing of note.

I/

SANATORIUM CHART.

Extending over 3 months.

NAME & AGE James Simpson aet 13.

DATE 1st March 1912.

CASE-BOOK No

NORMAL WEIGHT

HEIGHT

CHEST {INSP / EXP

Test Doses. Hospital Treatment. Dispensary Treatment.

1912. March April May

Date: 1 2 3 4 5 6 7 | 8 9 10 11 12 13 14 | 15 16 17 18 19 20 21 | 22 23 24 25 26 27 28 | 29 30 31 1 2 3 4 | 5 6 7 8 9 10 11 | 12 13 14 15 16 17 18 | 19 20 21 22 23 24 25 | 26 27 28 29 30 31 1 | 2 3 4 5 6 7 8 9 | 10 11 12 13

M E M E M E

SANATORIUM CHART.

Extending over 3 months.

NAME & AGE

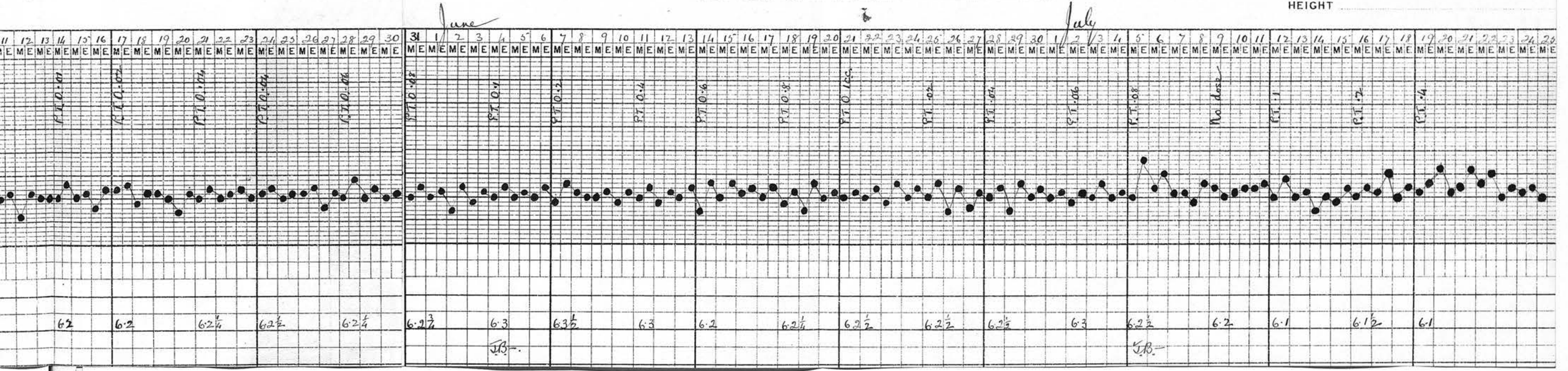
DATE

CASE-BOOK Nº

NORMAL WEIGHT

HEIGHT

TEST { INSPIRATION
EXPIRATION



I sent this boy into hospital where I gave him test doses and getting a positive reaction with T.K. ·0005c.c. I commenced treatment. In the chart appended the cumulative action of the repeated diagnostic dose T.K. ·0005c.c. will be noticed.

I commenced treatment with P.T.O. ·0001c.c. on March 13th and when discharged from Hospital on 18th April I had taken him up to P.T.O. ·006c.c. In hospital the only reaction of note was on 3rd April after a dose of P.T.O. ·004c.c. The same dose was repeated on 7th April without a resulting reaction.

From the Dispensary I started with P.T.O. ·002 c.c. and took him up to P.T. ·4c.c. where I terminated the treatment as I believed that to be the maximum dose in this case.

The disease is quiescent; he is in very good health and is now putting on weight. I append his hospital and Dispensary charts.

Case 6.

Tested with Tuberculin while living at home and treated from the Dispensary.

Mrs. Sanderson, aet. 40.

Complaint. Cough with some spit. "Run down".

Physical examination shewed some signs of Phthisis at Right Apex.

Sputum T.B.-

Albumen. Nil.

History/

History. Nothing of note.

I have described the test doses of this case under Diagnosis. I started treatment on 26th March with P.T.O. '0001.

Date	Dose.	Weight
26th March 1912.	P.T.O. '0001c.c.	11st. -1lbs.
29th " "	" ·0002 "	11" ¾ "
2nd April "	" ·0004 "	11" ¼ "
	Pain in back	
5th " "	P.T.O. ·0006c.c.	11" - "
	Pain in back.	
9th " "	P.T.O. ·0008c.c.	11" 1¼ "
12th " "	" ·001 "	11" ¾ "
	Pain in back excessive	
16th " "	P.T.O. ·001c.c.	10" 13¾ "
19th " "	" ·002 "	11" - "
23rd " "	" ·004 "	11" ¼ "
26th " "	" ·006 "	11" - "
	27th even. temp. of 99°	
30th " "	P.T.O. ·008c.c.	11" 1 "
3rd May "	" ·01	
	4th even. temp. of 99·4°	
7th " "	P.T.O. ·01.c.c.	11" ¾ "
10th " "	" ·02 "	11" 1 "
14th " "	" ·03 "	11" ½ "
17th " "	" ·05 "	11" 1¼ "
	18th even. temp. 99·4° and arm very painful	
21st " "	P.T.O. ·05c.c.	11" - "
	Pain in back	
24th " "	P.T.O. ·07c.c.	11" ½"
28th " "	" ·08 "	11" 1 "
31st " "	" ·1 "	11" ¾"
4th June "	" ·2 "	11" 1 "
	8th even. temp. 99·1°	
7th " "	P.T.O. ·4c.c.	11" 1½"
11th " "	" ·6 "	11" 1½"
14th " "	" ·8 "	11" 1 "
18th " "	" 1 "	11" 1 "

During treatment Mrs. Sanderson could undertake

all/

all her ordinary household duties except during two forenoons. I stopped treatment in this case at P.T.O. 1c.c..

The disease is quiescent. The cough has almost gone and she feels greatly the better of her treatment. She comes every two months for re-examination.

Case 7.

Attending work while undergoing tuberculin treatment.

James Gibson, aet. 16.

Complaint. Cough and Spit: Loss of weight.

Physical examination shewed Right Apical Phthisis.

Sputum. T.B.-

Albumen. Nil.

History. Father suffers from Bronchiectasis.
Patient has had pneunomia thrice.

This patient was notified as phthisis by Edinburgh Dispensary and came to me through the Leith Health Visitor.

As he worked in a flour mill some distance from the dispensary, he could only come once a week for injections. He continued at his work during the whole of his treatment. His chief complaint was of slight pain in his chest and back but it was never severe enough to prevent him from going to work.

I started him with P.T.O.·0001 on 12th March and stopped on the 2nd July when he had 1c.c. of P.T.O.

He/

NAME & AGE Mary Robinson aet 12

DATE

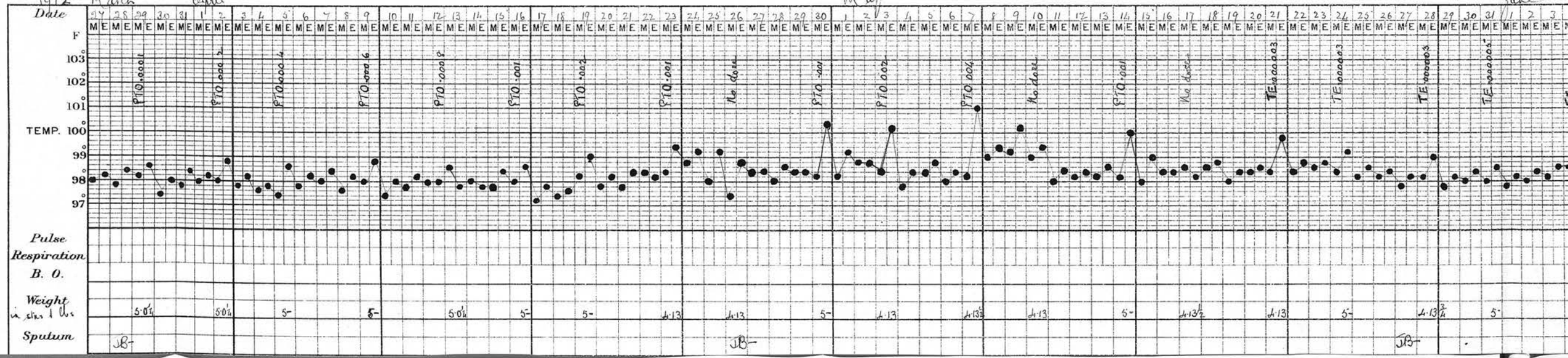
CASE-BOOK Nº

SANATORIUM CHART.

Extending over 3 months.

NORMAL WEIGHT

HEIGHT

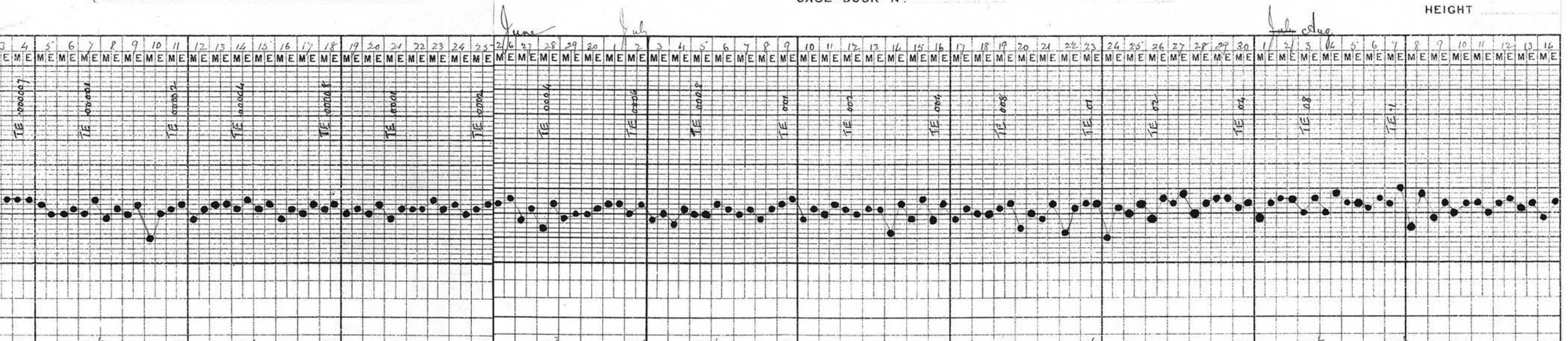


SANATORIUM CHA
Extending over 3 mont

NAME & AGE
DATE
CASE-BOOK Nº

NORMAL WEIGHT
HEIGHT

CHEST { INSPIRATION
EXPIRATION



He is now doing well and the disease is quiescent. His cough has completely gone.

His weight rose from 7st. 7lbs. at the commencement of treatment to 7st. 12 at the end of treatment.

Case 8.

Shewing how one Tuberculin was quite unsuitable while another was readily taken.

Mary Robertson, aet. 12.

Complaint. Cough long standing: Thick sputum.

Physical examination shewed distinct signs of Phthisis at Right Apex.

Sputum. T.B.-

Albumen Nil.

History Nothing of note.

I started with the small dose of P.T.O. ·0001 on 29th March and all went well till I came to P.T.O. ·001c.c. Extensive reactions set in but I persisted with P.T.O. up to ·004c.c. Each dose, however, was giving a more violent reaction. Accordingly I changed the Tuberculin to T.E. starting on 21st May with the small dose of ·000003 c.c. I had to repeat that dose three times before it was taken without a reaction. After that I increaded the dose of T.E. in the usual way and without a stop. I took the dose finally to T.E. ·1 where I ended the treatment for the time being.

Her weight increased from 5st. ¼lb. to 5st. 6lbs She is greatly improved and to all appearance the improvement/

improvement will continue.

Case 9.

Tuberculin in the Treatment of Lupus Vulgaris.

Ann Andrews, aet. 51.

Complaint. Lupus: Cough and Spit: Loss of weight.

Physical examination shewed extensive Lupus on both cheeks, nose and chin. The upper lobes of both lungs shewed distinct evidence of Phthisis.

History. Sister died of Phthisis.

Sputum. T.B.-

Albumen. Nil.

I started the patient with T.E. ·00001c.c. on Dec. 29th 1911 and I took the dose up to T.E. ·5c.c. by April 12th, where I stopped treatment as I believed I had come to her maximum dose. Distinct focal reactions were seen on the face with the first doses and healing of the face set in about the middle of March. Once started, the healing continued and at the beginning of June the nose and right cheek were healed and only one small patch was left unhealed on the left cheek. At the end of July the face was quite healed and now continues in that condition.

With regard to the chest condition it is much the same as when treatment was commenced. The cough/

cough, however, is not so troublesome and her appetite has improved. Her weight has not changed in 12 months which may be taken as a good sign.

Case 10 & 11.

Tuberculin in the Treatment of Phlyctenular Conjunctivitis.

Case 10. Hugh Roxburgh, aet. 8 sent to the Dispensary by the School Medical Inspector. This boy was suffering from phlyctenular conjunctivitis, which would not yield to treatment though various procedures have been tried during the last eighteen months.

His appetite was bad. His chest shewed no signs of Phthisis but his mother had died of Phthisis.

I decided to try Tuberculin and started with P.T.O. ·0001c.c. which produced a febrile reaction of 99·2° F and the eye condition shewed a distinct focal reaction - the inflammation being increased.

I gradually increased the dose but it took me three weeks to get up to P.T.O. ·0003c.c. Meanwhile the eye condition improved and the eye could be opened voluntarily without excessive pain.

When P.T.O. ·08c.c. was reached the eye was perfectly cured. Altogether the treatment lasted three months.

Case 11. Margaret Smith, aet. 12.

This/

This patient also sent by the School Medical Inspector, was suffering from a right apical phthisis and phlyctenular conjunctivitis of right eye.

I commenced treatment with P.T.O. on 4th Sept. but the doses were increased more gradually owing to her weak state of health and her bad home conditions.

P.T.O. ·0001c.c. was followed by :-

P.T.O. ·0002c.c.
" ·0003 "
" ·0004 "
" ·0005 "

This test dose given on Sept. 29th produced a temperature of 99°F. and the inflammation of the right eye was increased.

Three days later P.T.O. ·0006 was given and though no febrile reaction resulted the eye condition was made much more acute. This last reaction was an exaggeration of that produced by the dose of Sept. 29th.

I allowed seven days to elapse to give the eye time to recover, then on October 7th gave P.T.O. ·0005c.c. without getting a reaction of any kind.

P.T.O.·0006c.c. on Oct. 12th gave a temperature of 99°and a slight increase of the eye inflammation, but since that time no more reactions were obtained and the eye was quite cured by the end of October.

Case 12.

Tuberculin/

Tuberculin in Treatment of Scrofuloderma.

Catherine Steadman, aet. 6. She had a history of various skin affections and when brought to the Dispensary had an ulcer with undermined edges on the right cheek, another much the same under the chin, one on the right heel and one on the right elbow.

She had a slight cough, but there were no indications of Phthisis in the chest. I put her on P.T.O. giving the usual doses and had no febrile reactions except one after the first dose when a temperature of 92·2° F. was reached.

The ulcers shewed focal recations soon after treatment was commenced and were healed in three months.

CONCLUSIONS.

Tuberculin as an aid to diagnosis and treatment of tuberculosis cannot be done without in a tuberculosis Dispensary.

In diagnosis, Tuberculin gives the strongest and most conclusive evidence of the presence of ~~active~~ tuberculous disease whether active or not.

From a dispensary Tuberculin can be given for diagnosis only to certain picked patients and not at all in the case of children. The ideal plan is to do as at Leith where a certain number of beds are kept in Pilton Hospital for testing Dispensary cases.

In treatment Tuberculin will arrest the progress of active Tuberculous disease.

Tuberculin can be used with absolute safety in Dispensary practice.

A Tuberculin Dispensary can at once give proper scientific treatment to a tuberculous patient and it is not necessary for such a patient to wait until he can get into a sanatorium before receiving this treatment.

A Tuberculosis Dispensary where Tuberculin is not used does so little for the patient that he loses interest in his own case and forgets what he has/

has been told about infection and the means of its prevention. On the other hand Tuberculin given by hypodermic injections produces a self interest which results in all general directions being carried out.

Tuberculin Dispensaries will be the future means of educating the working class masses to the dangers of Phthisis and the methods of its eradication.

To stamp out Phthisis in young children, the School Medical Inspector should send all cases of Phthisis and all suspicious cases to the Tuberculin Dispensary so that they may be tested and treated with Tuberculin as required.